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Gold- and silver-based nano-particles influence pseudo-typed lenti-viral infection

Altunbek M., Yalvaç M., Keseroglu K., Palotás A., Çulha M., Rizvanov A.
Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

The application of bio-active noble-metal-based nano-particles (NPs) with unique physico-chemical properties is multifaceted. Among other roles, they can be used as anti-viral agents, and at the same time might serve as matrix to facilitate the transport of various molecules for therapeutic purposes directly or via genetically modified microbes. For this reason, the influence of nano-materials on viral infection in living cells is described in this study utilizing pseudo-typed lenti-viral particles based on human immuno-deficiency virus 1 (HIV-1). Cells were exposed to various NPs and subsequently infected with lenti-virus. Transfection efficiency was quantified by flow-cytometry analysis. Gold-based NPs increased, silver-containing NPs decreased, while other NPs had little or no effect on viral infection rate. The opposing effect of NPs is determined by the size, chemical nature and surface chemistry of the nano-materials, which govern their interactions with molecular species present in their environment. These characteristics enable the distinct use of different NPs in various fields of bio-medicine. © 2013 Bentham Science Publishers.

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Keywords

Cell culture, Infection, Lenti-virus, Nano-material, Nano-particle, Pseudo-typed lenti-viral particles, Transfection